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CREATIVE USE OF SCENARIOS

by

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April 1987

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Prepared for:
Director, Net Assessment
Office of the Secretary of Defense
Washington, D.C. 20301

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SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER NPS 56-87-001	2. GOVT ACCESSION NO. AD-A188 593	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) CREATIVE USE OF SCENARIOS		5. TYPE OF REPORT & PERIOD COVERED Final Report September 1986 - April 1987
		6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s) James John Tritten, Commander, U.S. Navy Department of National Security Affairs (Code 56)		8. CONTRACT OR GRANT NUMBER(s)
9. PERFORMING ORGANIZATION NAME AND ADDRESS Naval Postgraduate School Monterey, CA 93943		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS MIPR DWAM 70006
11. CONTROLLING OFFICE NAME AND ADDRESS Director, Net Assessment Office of the Secretary of Defense Washington, D.C. 20301		12. REPORT DATE 30 April 1987 13. NUMBER OF PAGES 16
14. MONITORING AGENCY NAME & ADDRESS(if different from Controlling Office)		15. SECURITY CLASS. (of this report) UNCLASSIFIED 15a. DECLASSIFICATION/ DOWNGRADING SCHEDULE

16. DISTRIBUTION STATEMENT (of this Report)

Approved for public release; distribution unlimited

17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)

18. SUPPLEMENTARY NOTES

Based upon presentation to conference at Rand Corporation on Scenario Planning, 26 June 1986. Presented at 28th Annual Convention of the International Studies Association, April 15, 1987

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

War Games
Simulations
Scenarios

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

Report discusses factor upon which scenarios depend in simulations and gaming, innovative and creative uses of scenarios to assist in analysis of complex political-military issues, to explore new ideas, for consensus building, or to shape perceptions are discussed. Major considerations in the design of scenarios are outlined. Author concludes that final measure of effectiveness for scenario is if it helped the play of a satisfactory game.

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S/N 0102-LF-014-6601

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Creative Use of Scenarios

James John Tritten

"Surprise and the Single Scenarios" is the title of a rather thought provoking article by Sir James Cable.[1] The essence of his thesis is that the United Kingdom should not prepare its military with just one contingency in mind. Related theses have been debated in the East and West for many years: should Soviet military strategy be based upon the doctrinal assumption of quick escalation to nuclear war? Should U.S. nuclear forces be procurred with the requirement to survive a well executed surprise first strike?

In considering these and related political-military questions, scenarios are often created to flesh out the concept being considered. For example, military planners in the USSR undoubtably use alternating scenarios to consider possible courses that armed conflict could take in order that they might assess the impact of short or long time scale on nuclear/conventional interactions. Similarly, varying scenarios are used in the U.S. to demonstrate the impact of different threat assumptions on the amount and types of nuclear forces that the U.S. should buy that would "guarantee" an acceptable level of retaliation.

The major point to all this, and this report, is that in order to perform complex political military assessments, political scientists either explicitly or implicitly use operations analysis techniques, including simulations, gaming, and scenarios. Many of the critics of these techniques have frequently dismissed their results by saying that the results of such techniques are "scenario limited."

Rather than bemoan such limitations, it is my intent to explore the opportunities and drawbacks of scenarios used in simulations and gaming when such techniques are used to explore complex political-military questions.

What Does a Scenario Depend Upon?

Scenarios cannot simply be congured up without consideration of the simulation, game, or analysis that they are to support. Scenarios do not have an intrinsic worth of their own: they are tools whose value is measured in the degree of support that they give to some other endeavor.

As such, perhaps the most important determinant of the scenario is the purpose for which it will be used. The purpose of the game will be influenced by and in turn influence a number of other factors such as available game time, game location, scenario time, sponsors, players participants. These additional factors will be discussed later.

Many simulations are done for training. A basic example of this is the fire drill for a ship's crew or the emergency procedures trainer for flight crews. In these simulations, the scenario is used to set a semi-realistic condition requiring personnel to exercise their skills in some area that otherwise would not be experienced. The emergency conditions are carefully controlled and participants are allowed to walk through their procedures, stop and analyze specific actions, or repeat them if necessary. Once practiced in a simulation, personnel actions taken in an actual emergency have the advantage of this type of preparation.

On a more sophisticated level, education also makes use of simulations. Long ago, lawyers recognized the value of moot court to assist candidates in becoming practicing attorneys. Similarly, model United Nations or governments are often used to expose students to the workings and authority of complex bodies. These type educational simlulations only make sense if some actors are required to be taken; a scenario is played out.

When students here have to go through the steps necessary to pass a bill or to defend a client, they see how political decisions are made and they

have the opportunity to refine their skills in such settings. Players and participants in these type simulations have the opportunity to learn much more than the facts of the process being simulated.

Similarly, games and simulations can be conducted for the purpose of stimulating well experienced participants to think. As such, the purpose of this type of game/simulation is also education but it requires a vastly different type of scenario. For example, if already qualified specialists in a particular political-military area were the players in a game whose scenario was designed to explore that specific area, a more advanced scenario would be required than if the players were being exposed to the concepts for the first time.

The more a game attempts to explore combat, or other areas that we cannot actually duplicate, the more interest there is in and requirements for good scenarios. If the underlying purpose of a war game is to not necessarily to explore war but to educate military officers about the political nature of war, a very sophisticated scenario is required. In such a case, games might be the most successful way to reach some individuals. Despite the fact that there are numerous articles and books on the relationship of war and politics, or that there are many number of university level courses one could take to discuss this area, the busy military officer may not have had the opportunity to do any of these. Exposure to a well constructed game with a supporting scenario might be just the short course necessary to get this most important point across.

Similarly, a free wheeling game whose scenario allows flexibility, might be just the vehicle to get a group of experts to interact on a topical issue in their field of expertise. A shared topic of interest is normally discussed by a group of experts by using the symposium, conference, or seminar environment. If on the other hand, such experts were involved in a game whose

scenarios stimulated them to think and deal with other experts in a non-threating simulated environment, the results of such interactions might well exceed that produced by more traditional methods. As an example, a group of individuals who have already written numerous articles and books on the subject of war termination might find that they stimulate others and it turn are stimulated by the interactions of a game whose scenario was designed to explore this issue.

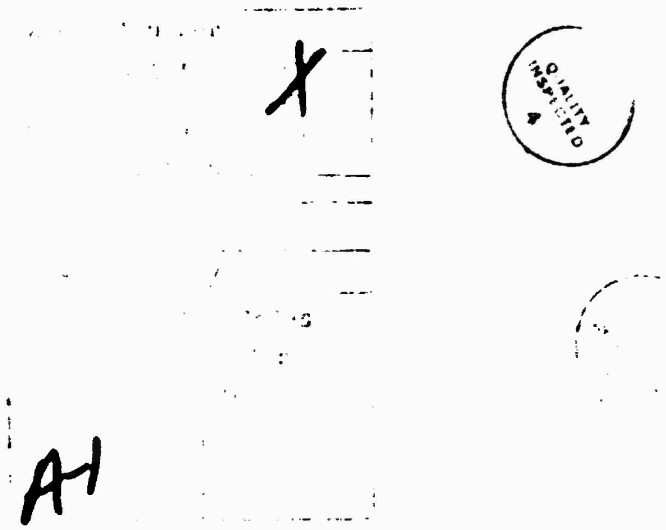
To get a group to consider extremely complicated issues, war termination being a good example, the scenario required might be one that is capable of knocking the legs out from under the players. Using that case, rather than have a scenario created out of the more customary cases of possible future wars, a totally unexpected but intriguing scenario might be just the vehicle to cause participants to focus on the major issue rather than how to fight or prevent the war in the first place.

Just as the Kremlin's experiences and expectations for war termination would not be a mirror image of those in the West, games and simulations can be an excellent vehicle to expose participants to such asymmetries. A well thought out scenario can be used to help Western Army officers understand that a future war in Europe/the Soviet Western Theater of Military Strategic Operations might not necessarily be represented by a series of pistons along avenues of advance. The Soviet preferred method and style of operation is instead, envelopment and encirclement. In this case, the war as fought by NATO might not necessarily be the same as that being fought by the Warsaw Pact. This creates complicated requirements for the design and play of a game.

Complex issues also require scenarios capable of moving from one spectrum of politics and war to another in order to play out all possible interactions that might occur. For example, in simulations, the arms control negotiation

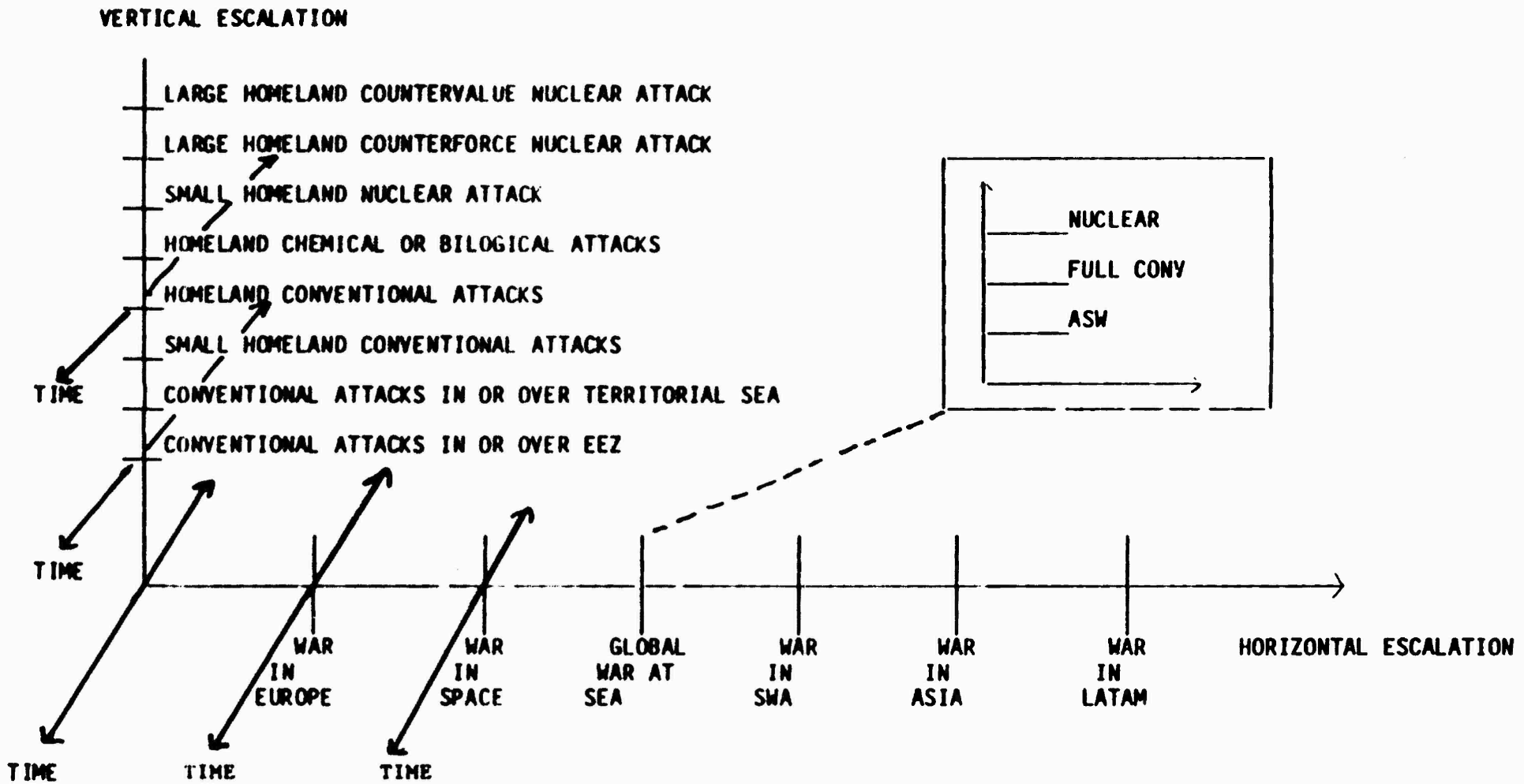
process, one needs to factor in the role of legislatures, courts, public opinion, the media, allies, etc. to more fully flesh out the complex interactions that influence or are influenced by the arms control issue at hand.

Similarly, a complete war game should not deal only with the armed conflict portion of the war. To do so will lead participants to believe that escalation decisions only involve moving up or down the so-called vertical escalation ladder or expanding/limiting armed conflict horizontally beyond or to theaters of origin. A more correct respresentation of war involving political, economic, moral and similar arenas would reveal that escalation also involves economic warfare, world public opinion, actions by allies, and the very crucial variable of time. Time as a variable in warfare is a most frequently overlooked one that scenarios by their very nature force participants to deal with. The act of extending the period of a war is also more correctly viewed as escalation. Figure (1) is a representation of the armed conflict portion of warfare. Similar diagrams need to be created for the components of war.



POSSIBLE
ESCALATION DIAGRAM

FIGURE (1)



By their very nature, games and simulations tend to focus investigation of outputs rather than inputs. As an example, a war game dealing with the air land battle on follow-on forward attack operations will help illuminate the net worth of either of the two concepts in achieving their objectives; not on input measures, i.e. the intrinsic nature of the command structure or on the forces to be purchases. If outputs are a better measure of political-military effectiveness, then this serves as prima facia evidence as to the worth of games to the threat and net assessment process.

Games and simulations may in fact be a major input to such analytic processes or conducted for other very specific purposes. In such cases, the scenario may be constrained by these other requirements. For example, if a game is designed to surface strategy/force mismatches, the scenarios may have to manipulate the force structure. Alternatively, forces can be held constant, and the strategy varied. The latter can be very helpful in illuminating better methods of conducting near-term campaigns. Generally, programming is better served by scenarios that manipulate forces while war planning is enhanced by variations in strategy while holding the forces constant to those actually on hand.

Programming and war planning games differ significantly and both need to account for the differences in declaratory policies and actual ones. Although forces tend to fight like they train, the actions one threatens to take in order to support deterrence, are not necessarily the ones that nations governed by real people will actually take when events actually occur. Scenarios need to account for the actions taken before a war to deter it, the very different action taken when planning to actually fight a war, and the possibility of executing such plans, and the quite unique circumstances undertaken to terminate a war.

Games and stimulations can allow nations to test new doctrines, strategies, operations, tactics, or alternative force postures. A well designed supporting scenario can help participants better understand the relationship of political interests to required military capabilities. They also can help those in positions of authority to understand that not only is war a competitive process, but so is the period between the armed conflict portion of wars.

Creative Use of Scenarios

In the late 1960s and early 1970s, Royal Dutch/Shell used a technique of "scenario planning" in order to prepare their business for a wide variety of futures.[2] One of the results of this effort was that Shell's management was better prepared for the 1973 oil crisis. Shell's scenario planning forced managers to deal with uncertainty and thereby understand and anticipate risk. It also helped them discover strategic options that they were not seriously aware of. Such an exercise afforded Shell the opportunity to gain a competitive advantage.

What is needed in the political-military arena is a recognition that in "peacetime," we are engaged in a long-term competitive relationship with the Soviet Union and perhaps other nations.[3] It is the authors opinion that with the arrival of nuclear weapons, the thinking of many strategists, even those in the military, precludes the use of the term "winning" during this peacetime competition (or even during a future war).

Whether or not one can "win" a future war, or whether or not we are in a competitive relationship with the USSR is not the issue for this paper. One can argue that the Soviets accept "winning" as the logical goal of any political conflict, but even if one assumes future wars are to be fought to a draw or that there is no competition between nations, scenarios and games offer governments the opportunity to explore ways to gain competitive

advantage or to at least force an opponent into a situation where he will not attempt to "win."

Fleet Admiral Chester Nimitz's experience prior to World War II in gaming possible conflict in the Pacific Theater have often been cited as one of the best examples of the value of gaming. Gaming efforts of the faculty and staff of the Naval War College in Newport between the World Wars allowed Nimitz to later remark that:

> "The war with Japan had been re-enacted in the game room here by so many people and in so many different ways that nothing that happened during the war was a surprise - absolutely nothing except the Kamikaze tactics toward the end of the war; we had not visualized those."[4]

One major difference in those war games and some of the ones being conducted today is, of course, that for Nimitz, "winning" in war was a perfectly natural and acceptable goal.

New techniques of artificial intelligence-like systems offer game sponsors the opportunity to explore wider ranges of alternative futures than have ever been possible before.[5] Games are not a substitute for reality nor a method of analysis but such new techniques afford us a tool to investigate alternate future scenarios and thereby assist analysts in assessing their impact. In other words, given a set of "what if" political, military, or economic conditions, modern gaming techniques can help government and businesses explore future scenarios that they might have to deal with.

With the speed available in these new techniques, instead of running one or even a handful of game and simulations each year, modern simulations centers will be able to run literally hundreds of alternate cases. By manipulating one or a few variables and holding the rest constant, analyst may

be better able to perform sensitivity and contingency analysis like they have never been able to do in manual games. Previous human games can be re-played by such techniques offering the first real opportunity to validate previous observations.

On the other hand, human play and large man-machine simulations will continue in the future for a wide variety of reasons. Although the advantages and opportunities of new gaming techniques are beginning to be appreciated, enormous caution must be exercised in their use. The modeling community cannot allow its sponsor to think that gaming and simulation lessons and insights that result from the manipulation of software or machines are any more "scientific" or "important" than those gained from any simulation technique.

Another use of scenarios is to create perceptions. For example; (1) if the politburo reads in the Western open literature that NATO commanders say that due to incomplete funding for conventional defense, NATO will have to resort to early use of nuclear weapons in self-defense; and (2) the Soviets percieve that there are nuclear weapons in Europe; and (3) the Warsaw Pact military reports that there are frequent exercises by NATO that clearly are designed to practice the early release of such weapons; then the politburo would be justified in reaching the conclusion if they break the peace, they risk nuclear war fighting.

Similarly, scenarios offer the opportunity for marketing ideas and consensus building. For example, if the Commander-in-Chief of the Soviet Navy was attempting to argue to the generals and marshals that his service was more important than normally thought, you might expect him to ask for a world-wide wargame or exercise where he would be allowed to demonstrate the opportunities for the use of the fleet in a very favorable light. In fact, if such

supporting scenarios are not played out then the credibility of the threat to employ his fleet worldwide is seriously undermined.

Considerations in Designing Scenarios

Although there should not be a "cookbook" for the creation of scenarios, it has become apparent to me in dealing with a number of individuals who have been asked to create scenarios, that some very key factors are often overlooked.[6] Hence, the following discussion is designed to assist the specialist in gaming and simulations when considering a task to create a scenario.

First - The scenario must be dependent upon the overall purpose of the game. As has been discussed earlier, whether or not a game or simulation is being played out for training, education, analysis and exploration, perception management, or consensus building, all will have a major and first order impact on the scenarios to be selected. Obviously, if a game is designed to validate or perform sensitivity analysis on a previous game, there will be major constraints on the scenario.*

Second - The available game time significantly influences the scenario that can be played. Global war games at the Naval War College that last weeks can go into much more depth than a half-day or one-day game held in Washington by participants who are often answering phone calls while engaged in the play. This is not to say that the long game is necessarily superior to the short simulation; that judgement depends on a number of factors, it is only to say that the scenario depends upon how long one can play.

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*Important to capture last minute or during game modifications to pregame scenario in this case. Artificial intelligence-like systems with their automated record keeping will greatly assist in subsequent replay of games.

One can attempt to increase the depth of the short game scenario by asking participants to read a scenario prior to the game. This may not work for the busy participant and may not even be worth the efforts. Naturally if a scenario contains classified material, the requirements to safeguard such material and account for transit time may preclude this option entirely.

Third - The players themnselves will significantly influence the scenarios. In my initial example of a fire drill, the scenario could be very brief and the players are likely to be technical specialists not concerned with major questions of policy. On the other hand, if one seeks the participation of chief executive officers, branch and department heads, the scenarios will most likely be very heavily oriented for major policy question and concern itself at the strategic level. Macro analysis versus micro analysis as the purpose during the game will result in vastly different scenarios.

Similarly, the participation by players with experience and/or education can also have a profound influence on the scenario. A macro approach war game for flag and general officers might require a scenario with significant emphasis on political context. The same game for academics might not work at all given the wrong set of players.

Fourth - The scenario also depends upon the time and setting of the simulation; i.e. what period of time the sponsor desires gamed and where the game is to be played. Time is a frequently mishandled variable. Whereas scenarios for present day games may be more easily created, the formulation of future scenarios challenges even the best political scientist. Yet precisely for this reason, games, simulations, and scenarios planning are powerful tools to help analysts gain insight into the future.

Even replaying historical events with variations can challenge historians to create an artificial environment of what might have been. Yet, historical

scenarios can be surrogates for present day situations that are otherwise awkward to handle. A good example of this is the Soviet military method of using historical scenarios to make points about questions of doctrine, strategy, operational art and tactics in an Aesopian web that substitute historical case study for the present or anticipated future.

Path gaming presents similar challenges for the creation of a scenario. One type of path game will pick an alternative future, say the President's dream of a defense-dominate world or one in which there are no ballistic missiles. The scenario for such a game is to go from the present time and move along one or many paths to that goal. The scenario for such a game may either be fixed or flexible. A path game that moves from the present to an unspecified future is the most challenging for the scenario writer since major portions of the scenario literally is made up during the game itself. This degree of flexibility calls for the use of personnel with experience and special skills.

The physical location of a game is also a major but often overlooked factor in setting a scenario. Games that cannot accommodate classified material will require only unclassified scenarios and data bases. Facilities that limit the number of players or that do not have the use of modern artificial intelligence-like support systems or other computers aids will result in less sophisticated scenarios than these which have these advantages.

Fifth - The sponsor of a game is a major variable in setting a scenario. If the sponsor desires to use the game to assist in the exploration in the nature of war campaigns, then a scenario that focuses on crisis response and arms control is totally out of place. Similarly, one would expect that if an agency sponsored a game, then the designers of the game and scenario would be either specifically or indirectly influenced by current or future programs or preferred strategies.

Final Observations

Scenario development for political-military game play does not need to be as detailed as one might imagine. For example, if a game starts with the current world conditions as is, a detailed state of the world or major intelligence briefing is probably not required for the players. Control, however, needs to have vast amounts of background material. New advances in computer aids or in artificial intelligence will greatly assist both players and control in keeping track of scenario state.

Unfortunately, there is no simple answer to the question of how detailed and complex a scenario must be to games in general. A large scenario might turn off senior players who simply do not have the time to be brought up to speed for a temporary simulation evolution. Similarly, a excruciatingly detailed scenarios might so stifle the players that the creative intellectual environment that the sponsor wanted cannot be achieved.

Scenarios simply cannot be written and left on a shelf to be pulled off when required. The factors that influence the scenario are far too numerous and important for such a process, although one might use such stored scenarios as a strawman.

Good scenarios writing can assist sponsors in using games and simulations to illuminate differences in perceptions, different concepts of operations, and to make concrete certain difficult to understand abstract concepts. As such, games and their supporting scenarios become one more tool for political-military research. Scenario creation also results in a check list of actions to be considered during real operations.

Scenarios creation in fact can be so important to the gaming and simulation process that a case can be made that the input phase of the game might even yield a higher pay off to the sponsor than will the results,

lessons learned, and other outputs.

The measure of effectiveness for a good scenario is whether or not it helped the participants and control play a satisfactory game. If more time is spent explaining or discussing the scenario than on the issues that the game or simulation is designed to explore, then the scenario was probably not worth it. The process of extracting the insights from the creation of a game, or its conduct, is an extremly difficult and time consuming process; one which takes longer than most sponsors are willing to allow.

We cannot afford to look only at single scenarios to political military simulations. Rather, a wide variety of scenarios should be examined as a sensitivity or contingency test: i.e. if finding hold up regardless of the scenario, then we can feel more confident over them. To only game a single scenario invites the type of myopia that lead to over reliance by the French on its Maginot Line or on strategic bombing as a deterrent by the British before World War II.

NOTES

[1]Sir James Cable, "Surprise and the Single Scenario," RUSI Journal, Vol. 128, No. 1, March 1983, pp. 33-38.

[2]Pierre Wack, "Scenarios: Uncharted Waters Ahead," Harvard Business Review, Vol. 85, No. 5, September-October 1985, pp. 73-89; and "Scenarios: Shooting the Rapids," Harvard Business Review, Vol. 85, No. 6, November-December 1985, pp. 139-150.

[3]See The Department of Defense Annual Report to the Congress Fiscal Year 1987, pp. 85-88; the Annual Report to the Congress Fiscal Year 1988, pp. 65-69; and the National Security Strategy of the United States (January 1987), pp. 4, 20.

[4]Lecture at Naval War College on 10 October 1960 cited in Francis J. McHugh, "Gaming at the Naval War College," U.S. Naval Institute Proceedings Vol. 90, No. 3, March 1964, p. 52.

[5]The Rand Strategy Assessment System (RSAS) is perhaps the best example of this. See Paul K. Davis and James A. Winnefeld, The Rand Strategy Assessment Center: An Overview and Interim Conclusion About Utility and Development Options, The Rand Corporation, R-2945-DNA, March 1983.

[6]Peter Perla, A Guide to Navy Wargaming, Center for Naval Analyses, CNR 118, May 1986, contains a useful checklist of the components for scenarios (p. 30). My own efforts are designed to expand upon his suggestions.

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